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### PLANT REMAINS FROM A PERUVIAN MUMMY BUNDLE

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#### INTRODUCTION

THE primary purpose of this paper is to describe and identify, whenever possible, the plant remains included in a mummy bundle from Paracas, Peru. A secondary purpose is to compare these specimens with plant materials that have been recovered from other Paracas bundles and described in the literature. The mummy bundle under consideration (cat. no. 38-28-30/4107-4233)<sup>1</sup> was recovered in 1927 from the famous Paracas Necropolis on the southern coast of Peru, and was presented in 1938 to the Peabody Museum of Harvard University by Mr. Nelson Rockefeller. I wish to express my appreciation to Dr. A. V. Kidder II, formerly of the Peabody Museum, for the opportunity of studying the plant remains included in the bundle. I also wish to thank Dr. J. O. Brew, Director of the Peabody Museum, for generously placing at my disposal the manuscript notes and illustrations relative to the bundle itself. Further, I acknowledge with thanks the assistance given me in this study by the members of the staff of the Peabody Museum, the Botanical Museum and the Biological Laboratories of Harvard University.

<sup>1</sup>The catalogue numbers cited are those of the Peabody Museum of Harvard University.



The archaeological site of Paracas is located on the hills and plain of that part of the Peninsula of Paracas that borders the Bay of Independencia. This peninsula is situated on the southern coast of Peru between the valley of the Pisco and the mouth of the Ica rivers, and, like the adjoining mainland, is virtually a desert supporting little or no vegetation. There has been much speculation as to whether or not such an environment could support a permanent population. Nevertheless, two well-defined, although related, cultures have been discovered at this site.

A number of deep burial chambers connected with the surface by shafts were discovered in 1925 on the upper slopes and terraces of the hill designated as "Cerro Colorado" (Tello, 1929; Carrion, 1949). The whole culture represented by these shaft burials is known as "Paracas Cavernas," and the evidence points to it as one of considerable relative antiquity. The second culture at the site of Paracas was first revealed in 1927 with the discovery of the famous Paracas Necropolis (Tello, 1929) located on the lower slopes of this same hill. Within the crude walls of the underground burial chamber, 429 mummy bundles of various sizes, mostly conical in shape, were found. The term "Paracas Necropolis" designates not only this particular site, but also the culture that these bundles and their contents represent. The most outstanding of the latter are the famous Paracas Necropolis textiles.

Most Peruvianists consider Cavernas the older of the two related cultural phases (Kroeber, 1944; Bennett, 1946; Bennett and Bird, 1949; Carrion, 1949). However, the question of chronology must remain open until such time as stratigraphic excavations are made. The area in which these sites are located is not hospitable to human occupation, and some authorities appear to agree



that the presence of so many mummy bundles indicates that they had been brought from elsewhere. However, others (Carrion, 1949) think that the cemeteries, refuse heaps and remains of habitations are evidence for a once flourishing local community that relied upon irrigation to transform this desert into arable land. They believe that the remains of such ditches as were necessary for this type of agriculture lie beneath the shifting sands of the peninsula. But again, this hypothesis may have to be revised as further detailed studies of the area are made.

The mummy bundle at the Peabody Museum illustrates the type of burial practised by the people who interred their dead at the Necropolis of Paracas (Natural History, 41: 119-125; Yacovleff and Muelle, 1934; Tello, 1929; Carrion, 1949). It was customary to place the body in a flexed position with the arms folded on the chest and the knees drawn up nearly to the chin. The body was then wrapped in textiles of varying degrees of elaboration and plain cotton cloth, with the final outer cotton wrapping securely fastened. Included in the bundle, besides textiles of various kinds and uses, were offerings of food, gourd containers which probably held either food or beverages, and other objects of value to the deceased during his lifetime. Many of the objects included in the bundle are of plant origin. In the present paper all vegetal materials found in the Peabody Museum mummy bundle will be considered except textiles. With this exception, the plant remains consist of food, gourd containers, wooden objects, matting and basketry, raw cotton, and several specimens that were either too small or too poorly preserved to be botanically identified. The plant specimens were found in various parts of the bundle, and some of them were undoubtedly in different positions from those that they originally held, due to the natural slumping of the body. The majority of the in-



dividual specimens are fairly well-preserved, which in all probability may be attributed to the arid conditions existing on the peninsula.

A general description of the reconstruction of the mummy bundle, based upon a study of its careful unwrapping with particular emphasis on the plant remains, follows.

#### RECONSTRUCTION OF THE MUMMY BUNDLE

The unwrapped mummy bundle formed roughly a low cone, smooth in contour except for the projection of the turbanned "head" under the outer wrapping (Plate LXXV). The maximum diameter of the bundle was 1 m. ; the maximum height 63.5 cm. The outer wrapping of the whole bundle was a long, plain, warp-faced cotton cloth resembling modern canvas in texture. This had been placed over the bundle, with the free ends of the cloth wrapped spirally from left to right. To facilitate describing the bundle as it was originally constructed, the contents have been arbitrarily divided into four layers which are delimited by the presence of wrappings of plain cotton cloth.

The body had originally been placed in a flexed position, but with the passing of time it had slumped backward with the knees falling to the right. The legs had been tied together by a three-strand fiber braid (30/4160). The arms were still folded and the head faced directly forward. A wad of raw cotton (30/4180) had been placed over the face, and this was held in position by a loosely woven cloth, the ends of which were tied at the back of the head. A head band had been securely wrapped around the forehead. A string of beads and two textiles, one a plain apron, the other a knotted net, were placed about the neck. Fragments of this net were found on the outer surface of part of a large gourd (30/4199) that rested on



the chest of the mummy. A twig wound with cotton thread (30/4161) was enclosed within the folds of these two textiles. Attached to the apron and net at the back of the neck was a small bag of cotton netting containing several pieces of cloth, two smaller nets and a number of fragments of leaves (30/4197).

A shawl had been draped about the body, the ends being brought forward and placed over the gourd on the chest. Inside of a bag which had been placed on top of the shawl was a small knitted bag containing four small bundles of raw cotton wound with cotton string (30/4181). Two of these contained a red pigment; each of the other two a small pellet of oily texture. Various textiles had been wrapped about the upper part of the body, and among these were found a flake of gold and a few kernels of maize (30/4189) which presumably had fallen from the mouth and nose of the mummy. It appears to have been customary to place either kernels of maize, bits of raw cotton or small objects of gold or other material in the mouth or nose of the deceased.

Among the other specimens that had been included in the bundle at this point of its construction were four hanks and four balls of cotton thread. Below the right knee were the much disintegrated remains of a small coiled basket (30/4228). Apparently this basket had originally been placed in the lap of the mummy and had contained, in addition to a fragment of llama wool, a number of plant specimens, probably as a food offering. These comprised remains of peanuts (30/4182), maize (30/4184, 30/4185, 30/4187, 30/4188) and four roots (30/4190, 30/4192, 30/4193, 30/4198).

Several miscellaneous items which presumably had fallen from other parts of the body were discovered at the bottom of the bundle. Among these were a cob of maize (30/4183), another cob with attached kernels



(30/4186), three twigs (30/4194), two seeds (30/4196) and two roots (30/4191, 30/4195). At this point in the preparation of the bundle, two large pieces of plain cotton cloth had been wrapped about the entire body in five layers, and then seamed at the back. This concluded what is considered as Layer I in the construction of the bundle.

Immediately over the plain wrapping that terminated Layer I were several textiles and a woven band that had been placed about the neck of the mummy and knotted in front. Contained in this band were a small gourd (30/4200), a fiber sling with a feather-tuff ornament (30/4170), a miniature feather fan with a fiber handle (30/4178), two shells stuffed with cotton (30/4210, 30/4211) and a number of small objects wrapped in cotton (30/4201) (Plate LXXVI). It appears that at this point in the construction of Layer II, the mummy had been placed in a large basket made for the purpose (30/4227) (Plate LXXV), and several textiles had been stuffed into the container in front of the body. The bundle and the large basket containing it were then wrapped in two plain pieces of cloth that had been sewed together. This terminated Layer II.

Three coarse textiles, which constitute Layer III, were then placed about the bundle. The last of these textiles had been folded and seamed up the side to form a sack. The mummy was placed in this and the slack folds were drawn together and stitched with a coarse thread. The sewing threads met at the top and were wound around the upper edges to form a top-knot. After the sewing of one of the slack seams, the threaded, wooden needle (30/4229) which had been used was left sticking into the folds of the wrapping.

At the beginning of Layer IV a turban was wound about the upper part of the cone to form a "false head,"



the mummy's head now being located well within the present bundle of wrappings. Immediately below this "false head" and covering the lower edge of the turban was a sling (30/4175) (Plate LXXVI), and on the right shoulder a feather fan (30/4179) with a fiber handle resembling the miniature fan that had been included in Layer II. Within the folds of the various textiles that composed Layer IV were two wooden sticks, one a baton of polished wood (30/4231); the other unpolished, but wrapped with sinew about the larger or upper end (30/4230). Finally, the terminal wrapping of coarse, plain cotton cloth was placed about the whole bundle with the ends wrapped spirally from left to right. The bundle now formed a slightly irregular cone (Plate LXXV), smooth in contour except for the projection of the turbanned "head" under the outer wrapping. The completed bundle was lowered into the grave pit and surrounded by a reed mat (30/4226), presumably to protect it from the earth.

This bundle does not differ markedly from others that have been described from this site (Yacovleff and Muelle, 1934; *Natural History*, 41: 119-125; Carrion, 1949). In fact, there appears to be a certain uniformity, not only in the general construction of the bundles, but in their contents as well. These bundles consist of both plain and elaborately constructed fabrics of various uses, design and color, although the number and quality of the latter type may vary in different bundles. In addition to textiles, there were various objects some of which would appear to have had a ritualistic significance.

#### DESCRIPTION OF THE PLANT REMAINS FROM THE MUMMY BUNDLE

From the standpoint of identification, the plant material from archaeological sites in Peru may be divided



into three classes. In the first group are those materials which, because of their structure and composition, have withstood well the ravages of time. One can often determine the genus and in some cases the species to which a specimen in this class belongs from the macroscopic appearance alone. However, there are other specimens which, although well-preserved, are either too small or too lacking in the necessary details to make identification possible.

In the second group occur plant parts of finer texture, which have been thoroughly dried and are usually too thin and brittle to withstand any pressure or handling either within the site or later during study. The most common examples of this group are pieces of leaves and small stems. These are usually fragmentary when found, or else become so through handling soon afterwards. Identification is far more difficult in this group than in the first.

A third type of plant specimen, sometimes found in these sites, shows the results of various stages of decay or even possibly the results of pre-burial treatment such as cooking. Specimens of roots and tubers may fall into this category.

All three of these types of materials were represented by the plant remains found in the mummy bundle under discussion. A detailed description of these specimens follows, with the genera arranged in families according to the Engler and Prantl system of classification.

#### GRAMINEAE

##### *Zea Mays* L.

The maize specimens in the mummy bundle consisted of one whole cob (30/4183), two broken cobs (30/4184, 30/4186) and several cob fragments (30/4185, 30/4187). In addition there are a number of kernels, some still



attached, others dissociated from the cobs. From these groups of specimens it was possible to reconstruct the type of maize.

The length of the intact cob is 6.2 cm., while the original length of the two broken cobs appears to have been approximately the same. The cob diameters of the three specimens average 23 mm.; the rachis diameters average 11 mm.; and the cob/rachis index is 2. The rows are irregular and spiral slightly to the left, and in one specimen double spiralling is present. The row number of the three specimens averages 12.2.

The cupules of all the cobs are hairy, and in those specimens where the rachis flap could be examined, it was found to be weak. There is a uniformity in the characteristics of the lower glume. The texture is fleshy with no evidence of either hairiness or venation. Likewise, there is a similarity in the upper glumes. They are slightly boat-shaped and of a chaffy texture. The surface is glabrous with no evidence of venation.

The kernels are gray-brown or in some cases black in color, with an average length of 7 mm. and an average width of 6 mm. The endosperm is hard and flinty, which points to the specimens as being a type of flint corn. This type of maize is common in pre-Columbian sites in Peru. There is no evidence of imbrication, but, in a few instances, there is a slight denting of the dorsal surface of the kernels. Mangelsdorf (1942) has found both flint and dent characteristics in the maize that he examined from Paracas Necropolis.

The presence of maize is recorded for the American Museum of Natural History bundle (Natural History, 41: 119-125), and both Yacovleff and Muelle (1934) and Carrion (1949) also mention it in their accounts of the bundles that they examined. Certainly from the descriptions of plant specimens from the archaeological sites of



Paracas, one is justified in placing maize among the more important staple foods of the people of the peninsula.

#### CYPERACEAE

##### *Scirpus* spp.

Only fragments remain of the woven mat (30/4226) that had been placed about the bundle when it was lowered into the grave pit. The simple twill weave of the mat is made of the stems of a species of *Scirpus*, and the edge is reinforced with a tightly twisted cord of this same material.

The two fans that were included in the bundle differ little except in size. The larger (30/4179) has a maximum length of 18 cm. and consists of eight yellow wing feathers. The smaller specimen is a miniature fan (30/4178) and is made of yellow breast feathers. Its maximum length is 7.5 cm. The feathers of both specimens are undoubtedly those of parrots or macaws. The handles are constructed alike. In the case of the larger fan five or six culms of a species of *Scirpus*, and in the smaller specimen three or four culms of the same material, were double-looped in such a way as to hold the quills tightly. The free ends of the culms form the handles. These were cut off evenly, twisted slightly and then bound securely with cotton thread. Apparently the cotton thread in each specimen had held the quills before they were placed in the loops of the culms and then was wrapped about the culm ends.

Yacovleff and Muelle (1932) give "totora, *Scirpus totora*," as the material from which the baskets, mats and ropes were made that were recovered from the sites on Cerro Colorado. However, because this species of *Scirpus* is native to the high altitudes of the Andes (Beetle, 1945), it would seem more advisable to identify our culms merely as *Scirpus* spp. Several species of this



genus are found on the Peruvian coast and fragments of matting and ropes made of this reed have been recovered from other coastal archaeological sites.

#### AMARYLLIDACEAE

*Furcraea* sp. prob. *F. occidentalis* Trel.

Two similar fiber slings had been placed in the bundle. One of these (30/4175) is approximately 82 cm. in length and the plaits of fiber average 8 mm. in width. The other sling (30/4170) is approximately 74.5 cm. long with plaits averaging 6 mm. in width. Both are made of the fibers of *Furcraea*. The plaited fiber is knotted at one end while the other end is allowed to fray for a distance of 7.5 cm., at which point the braid is carefully tied with cotton thread. This thread holds in place a cluster of short yellow feathers used to ornament the sling.

The braided cord (31/4160) which bound the limbs of the mummy is made of three-ply fiber of *Furcraea* sp. This specimen is in a poor state of preservation and is broken into lengths that vary from 5 to 66 cm. It is not possible to tell whether all of these had once been part of one length of cord. The width of these different pieces of braid measures from 4 to 8 mm. The braids retain their original shape until the separate ply are disturbed. It is then that the strands break into small pieces and thus prevent a more careful examination of the component fibers.

Compared with other bundles, it would appear that it was customary to bind the limbs in order to retain the body in a flexed position.

The Museum of Natural History mummy bundle (Natural History, 41: 119-125) and those examined by Yacovleff and Muelle (1934) and Carrion (1949) contained objects made of this fiber.



## EXPLANATION OF THE ILLUSTRATIONS

PLATE LXXV. *Upper figure.* Unwrapped mummy bundle. The rolled fabric at the base of the bundle is a protective covering of modern burlap.

*Lower figure.* Mummy seated in the large basket after the textiles comprising the three outer layers had been removed.

*Courtesy of the Peabody Museum, Harvard University*



PLATE LXXV





## EXPLANATION OF THE ILLUSTRATIONS

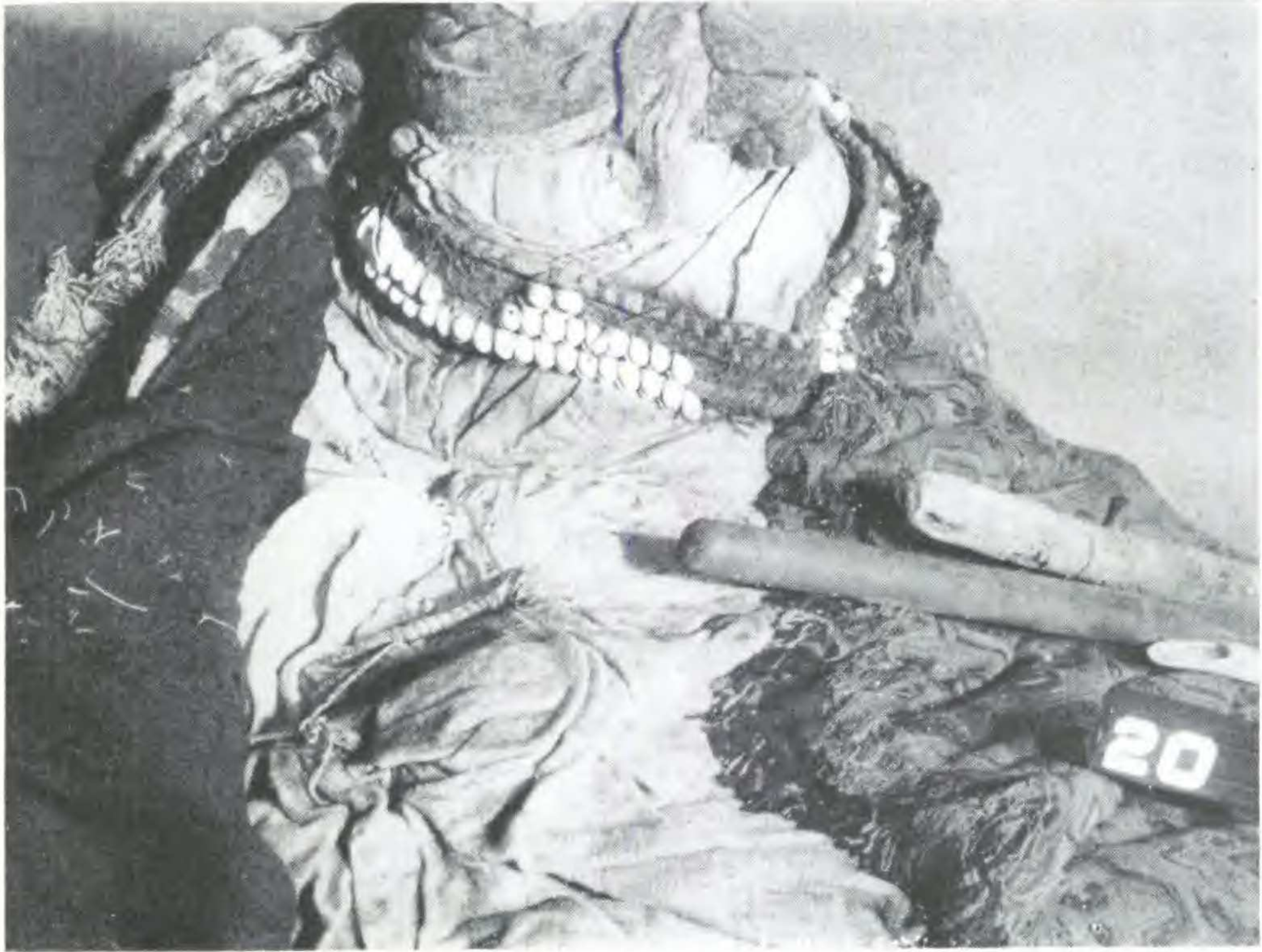
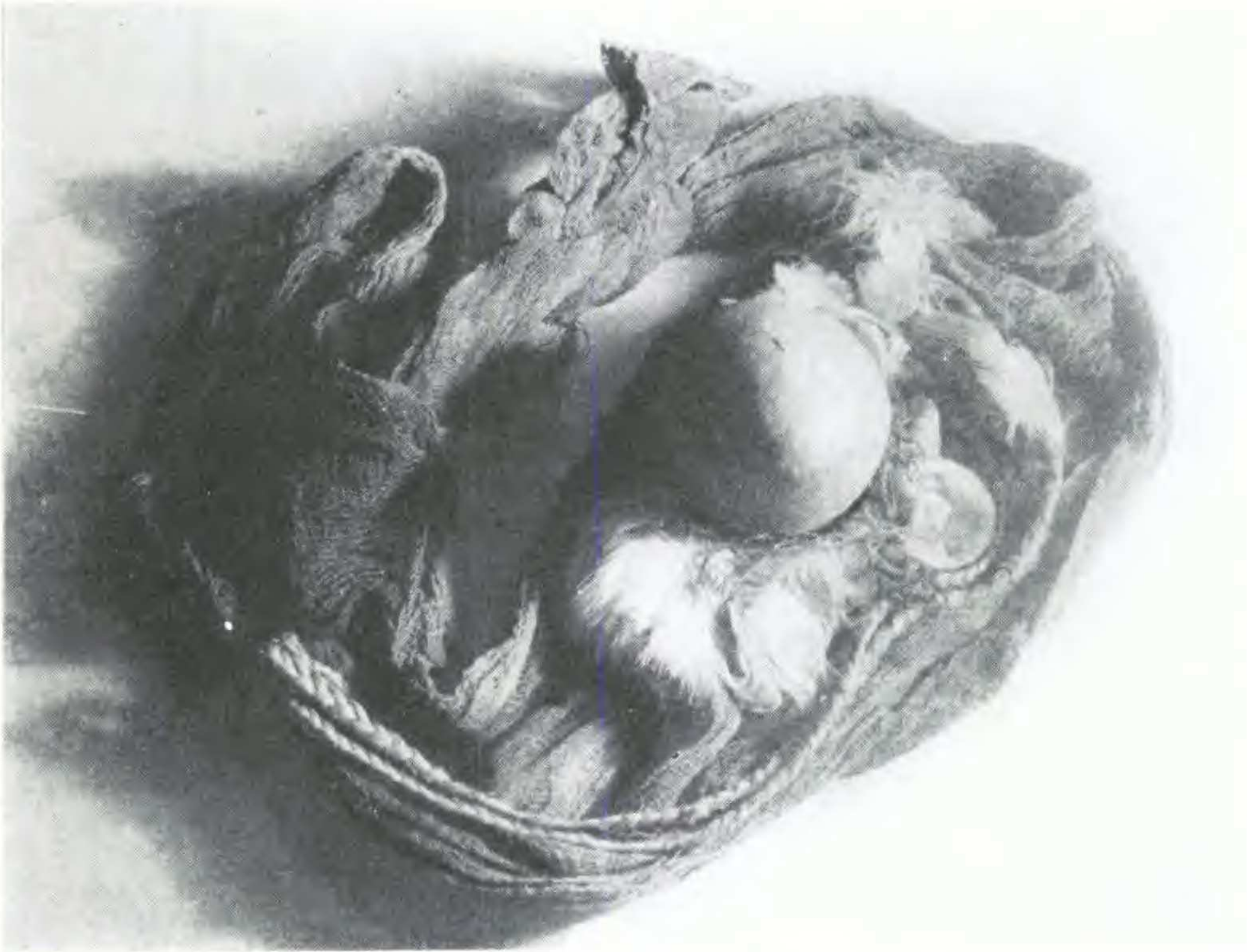
PLATE LXXVI. *Upper figure.* The contents of the woven band found about the neck of the mummy: a small gourd, a fiber sling, a miniature fan, and shells containing raw cotton.

*Lower figure.* Details of Layer IV including a fiber sling around the edge of the turban, a feather fan, a baton, and a sinew-wrapped stick.

*Courtesy of the Peabody Museum, Harvard University*



PLATE LXXVI









## LEGUMINOSAE

### *Arachis hypogaea* L.

This species was represented in the bundle by four well-preserved, whole pods and several dissociated seeds (30/4182), all originally contained within the small coiled basket (30/4228). The pods are slender and thin-shelled, varying in maximum length from 3.4 cm. to 4.5 cm.; and in maximum diameter from 1.2 cm. to 1.3 cm. They are brown in color and have the heavy surface reticulations characteristic of many prehistoric Peruvian peanut pods. All have one pronounced dorsal, hump-like protuberance. The presence of this protuberance as well as the reticulations on the surface are also found in certain modern varieties. The seeds, two in a pod, have an average maximum length of 1.4 cm. and an average maximum width of 9 mm. They are either pointed or rounded at one end and are flattened at the other. The pointed or rounded surface faces the end of the pod, while the flattened one faces the other seed.

Peanuts are reported as part of the food offerings found in the bundle described by Yacovleff and Muelle (1934), as well as that at the Museum of Natural History (Natural History, 41: 119–125). Mangelsdorf (1942) identifies them among the plant remains from Paracas which he examined. In fact, this legume is one of the most common food plants recovered from Peruvian coastal sites.

### *Pachyrrhizus tuberosus* Spreng.

One well-preserved root of this species (30/4190), commonly known in Peru as jiquima, was found in the bundle, and apparently had been placed originally in the small basket (30/4228) with other items of food. This specimen has a maximum length of 9 cm.; a maximum



diameter of 1.8 cm.; and it tapers to a point at each end. The exterior surface is a gray-brown color and is much wrinkled from drying, resulting in parallel, longitudinal furrows. The cream-colored interior is solid, and gave a positive reaction when tested for starch with an iodine solution.

The microscopic examination showed starch grains of kettle-drum, circular and polygonal shapes with a few twin aggregates. There are both small and large granules, the former being irregular and seeming to be predominantly two- and three-sided. The hilum is concentric; the lamellae indistinct. The grains measure 5.4 to 18 micra in diameter.

Yacovleff and Muelle (1934) report jiquima from the Necropolis of Paracas and state that roots of this species are frequently found in funeral bundles from this site. They further add that some of these specimens were originally identified as yacón (*Polymnia sonchifolia* Poepp. & Endl.), but that these have since been checked and found to be jiquima. In addition, they say that other roots from Paracas Necropolis have been identified as those of the sweet potato (*Ipomoea Batatas* (L.) Poir.). However, they do not accept these latter identifications.

Yacovleff (1933) has made an extensive study of this root and its presence on the southern coast of Peru in prehistoric times. He has identified not only the remains of jiquima, but pottery representations of it as well. In addition, he has attributed the elements of certain decorative designs to various parts of the plant.

Mangelsdorf (1942) identifies a root found in a mummy bundle from Paracas Necropolis as that of *Pachyrrhizus Ahipa* Parodi.

#### EUPHORBIACEAE

*Manihot esculenta* Crantz.

A root of manioc (30/4193) was included among the



food offerings recovered from the bundle. Decay has caused one part of the surface of the specimen to become softened and this area is easily broken. Its present maximum length is 9.9 cm. ; its maximum diameter 2.3 cm. ; and it tapers slightly toward the tip. The color of the smooth exterior surface ranges from a light to a dark brown. The fibrous, cream-colored interior gave a positive starch test with iodine.

A microscopic examination of this root showed both large and small starch grains. The granules, regardless of size, possess the same characteristics. They are in twin or triplicate aggregates of truncated grains which, when dissociated, are either circular or kettle-drum in shape. Their diameter measures from 9 to 21 micra. The lamellae are evident, but not distinct. The hilum, either a dot or cleft, is eccentric. These granules are indistinguishable from the granules of modern cassava.

Yacovleff and Muelle (1934) and Carrion (1949) report having found manioc in the mummy bundles which they examined, identifying these roots as *Manihot* spp. Mangelsdorf (1942) identifies a specimen of the root from another bundle from Paracas Necropolis as *Manihot esculenta* Crantz. Yacovleff and Herrera (1934-35) have pointed out that representations of this plant were often used by the ancient Peruvians for decorative purposes.

#### MALVACEAE

*Gossypium* sp. prob. *G. barbadense* L.<sup>1</sup>

Cotton was found in the mummy bundle as raw fiber, yarn or thread and textiles. Four hanks and four balls of cotton yarn were included in Layer I. Thread had been utilized as a sewing element to tie small objects

<sup>1</sup>The specific name *Gossypium peruvianum* Cav., which has been widely used to describe Peruvian cotton, is now included with several other species under *G. barbadense* L. (Harlan, 1939, p. 48).



and to secure parts of other specimens. The cotton used in the construction of the handles of the feather fans is an illustration of the latter use. The study of textiles is a specialized field and is not within the scope of this paper.

There were a number of specimens of raw fiber in the mummy bundle. During the preparation of the body for burial, a large wad of cotton (30/4180) was placed over the face. A small amount of fiber had been stuffed into the neck of the bottle gourd (30/4200), apparently to protect the contents. In addition there were two shells each stuffed with raw cotton (30/4210-11) and several small objects of gold wrapped carefully in the same material (30/4201). These were found in a woven band about the neck of the mummy. Also included were four small rolls of cotton (30/4181), each averaging 3 cm. in length and tied with cotton string. These strings are 15 mm. long and were wrapped several times around the rolls and secured with a simple knot. The contents of these bundles were of particular interest. Two of the rolls contained small grains of a bright red pigment each approximately 1 mm. in diameter; the remaining two each held a small, amorphous pellet, 1 cm. long. These are a light brown color and in cross-section show a smooth, slightly oily surface of a light yellow hue. The samples of pigment were analyzed to determine whether or not they were of plant origin.<sup>1</sup> The red material proved to be cinnabar (Mercuric Sulphide), while the brown pellets are a mixture of powdered sphalerite (Zinc Sulphide) and an organic substance, either a wax or an oil.

Inorganic pigments have been found in other bundles from Paracas Necropolis. Powders of different colors had been placed in small pieces of skin and tied securely. Such specimens at first were thought to be of vegetable origin,

<sup>1</sup>These analyses were made by Mr. F. A. Gonyer of the Mineralogical Museum of Harvard University.



but upon examination proved to be inorganic in nature. Both Fester and Cruellas (1934) and Yacovleff and Muelle (1934) refer to cinnabar as having been used as a body paint by the people of Paracas, and it is indeed probable that sphalerite was used in a like manner.

The specimens of raw cotton described above vary in color. They are either a creamy-white, an earth-yellow or a tawny-brown. All the fibers examined show convolutions and they range in length from 15 to 29 mm. Many of these specimens are exceedingly brittle and when handled they quickly disintegrate.

Other mummy bundles from Paracas Necropolis which have been described in the literature contained specimens of raw and worked cotton similar to the materials included in the Peabody Museum bundle.

#### CUCURBITACEAE

##### *Lagenaria siceraria* (Mol.) Standl.

Two specimens of gourds are included among the plant remains from the mummy bundle. One of these is a shallow dish (30/4199) with uneven edges made from the flower end of a large fruit. Its maximum diameter is 19 cm.; its maximum wall-thickness 4 mm. Part of the fine cotton netting, which had been placed about the neck of the mummy, still adheres to the bottom of the dish. There is no evidence of the original contents of this gourd.

The second specimen (30/4200) is a small, bottle-shaped gourd. It has a maximum height of 7.8 cm.; a maximum diameter of 6.8 cm.; and the mouth of the gourd contained a plug of cotton fiber. Inside was a small amount of fine, dark powder, which gave a negative reaction when tested for starch with iodine. However, when a specimen of this powder was examined under the



microscope, it was found to consist of infinitesimal bits of cotton fiber, probably from the brittle cotton stopper, and the remains of the pupae of several larvae. These have been identified as belonging to the saprophagous genus *Callitroga* (*Cochliomyia* and *Chrysoma*).<sup>1</sup>

Yacovleff and Muelle (1934) mention a gourd bowl found near the neck of the mummy that they examined. This specimen also contained both the powder and the larval remains. They state that the former constitutes the remains of certain organic substances. The description of the Museum of Natural History bundle (Natural History 41: 119-125) mentions finding a calabash which had been tied in a net bag about the neck of the mummy.

The placing of gourd containers within the mummy bundles of Paracas Necropolis was apparently part of the customary procedure of their preparation. However, specimens of *Lagenaria* are even more commonly found in the burials of the earlier Paracas Cavernas cultural phase (Carrion, 1949).

## UNIDENTIFIED PLANT REMAINS

### *Wood*

A needle (30/4229) still threaded with cotton was found thrust through the final wrapping cloth of Layer III. Its maximum length is 15.2 cm.; its maximum width at the eyed end 4.5 mm.; and it tapers to a blunt, rounded end 2 mm. in diameter. In cross section the specimen is flat, with rounded edges, averaging 2 mm. in thickness. The surface of the needle is smooth. It appears that the needle had been fashioned from part of the stem of a large monocotyledonous plant, probably either the grass "caña brava" (*Gynerium sagittatum*

<sup>1</sup>This identification was made by Dr. Charles T. Greene of the Bureau of Entomology, U.S. Department of Agriculture.



Beauv.) or a species of "chonta" (*Guilielma* sp.), a palm. Both plants have been reported as having furnished the raw material for artifacts recovered from Paracas. In the botanical literature "caña brava" is reported from this section of the coast of Peru, whereas "chonta" is recorded from northern Peru and Bolivia. If the plant used in the manufacture of the needle is *Guilielma*, its presence at Paracas may be explained by the possibility of its having been an item of trade in prehistoric times.

A straight wooden stick (30/4230) of a light color had been placed in the folds of the mantles of Layer IV. It is 44.5 cm. in length and has a maximum diameter of 2.6 cm. At a distance of 3.4 cm. from the upper end of the stick, is a wrapping of sinew which extends for a space of approximately 7 cm. From this point the specimen tapers slightly to the lower end. The wood is partially decayed and has been attacked by insects. From microscopic sections, it has been identified as possibly willow.

A baton (30/4231) was also found in this location in the bundle. It is 57.4 cm. long, round in section and from 1.9 to 2 cm. in diameter. The wood is dark, heavy, fine-grained and hard. The entire surface appears to have been smoothed and polished, perhaps the result of much handling. This specimen has been designated a "baton" because of its convenient size for holding in the hand as a symbol of authority. The wood of which it is made has been tentatively identified as one of the Leguminosae, possibly *Caesalpinia* sp.

### *Roots*

In addition to the roots of manioc (30/4193) and jiquima (30/4190) described above, four other root specimens were found in the bundle. Two of these (30/4192, 30/4198) were apparently part of the contents of the small basket; the other two (30/4191, 30/4195) were



found in the bottom of the bundle where they had fallen either from the same basket or from some undetermined location in the mummy wrappings. These four roots were too badly decayed to permit of their botanical identification.

Only one of these specimens (30/4191) gave positive results when tested for starch with an iodine solution, and the presence of a few starch grains could be detected when the specimen was examined microscopically. These starch granules are irregular in shape, as though they had become swollen and then crushed, and some of them show a three-cornered fracture. This condition might possibly have been caused by pre-burial heating in the presence of moisture, or again, might merely be the evidence of the degree of disintegration of the specimen. The more regular grains are round, but truncated on one side, and measure 6.95 to 12.51 micra in diameter. The central portion is denser than the outer, and in some of the grains single or clustered crystals appear in the denser area. Lamellae are apparent but not distinct. The hilum, is not evident, but may be hidden either by the crystals or by the above-mentioned cracks. This description is not consistent with that of starch grains of any of the available comparative material.

#### *Twigs, Bark and Leaf Fragments*

Two twigs or stems (30/4194) measuring 1.7 cm. and 2.5 cm. in length respectively, and a small piece of bark (30/4196) were found in the bottom of the mummy basket. These plant specimens gave no clues as to their botanical identification.

A small roll of alpaca fiber (30/4197) held together with cotton thread contained a small quid of macerated leaf tissue. A few of these leaf fragments were a light brown color and had a smooth epidermis. The others